

AMENDMENTS TO THE CLAIMS

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Cancelled)

13. (Cancelled)

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Currently Amended) ~~The~~ A method of producing a DNA molecule of 1-10 kilobases of user-defined sequence from short oligos of length n (n-mers) of ~~claim 11~~ , comprising the steps of:

virtually preselecting a multiplicity of DNA sequence segments that will comprise said DNA molecule of user-defined sequence by using computational techniques to virtually break said user-defined sequence into virtual fragments of length n (n-mers) of defined size.

providing fragments in vitro by providing fragments of length n (n -mers) of defined size that correspond to said virtual fragments wherein said multiplicity of DNA sequence segments comprise oligos in multiple reading frames,

arraying fragments in vitro by arraying said fragments of length n (n -mers) of defined size into groups,

separating DNA sequence segments temporally in vitro by separating said DNA sequence segments of length n (n -mers) of defined size temporally, and

assembling groups in vitro by assembling said groups into double-strand DNA molecules of predetermined base-pairs using parallel synthesis, DNA shuffling, and DNA polymerase wherein said step of separating said DNA sequence segments temporally and said step of assembling said groups into double-strand DNA molecules of predetermined base-pairs is accomplished by said DNA sequence segments being added gradually, in an order that is predicted computationally to minimize errors to produce said DNA molecule of user-defined sequence, and

wherein said step or assembling said groups into double-strand DNA molecules utilizes starting oligos of length n (n -mers) where n is an odd number.